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Patent claims

1. Flexible chip systems for the thermodynamic activation and control of dermal and transdermal systems, characterized by the feature that use is made of patch-like chip systems for the thermodynamic control of topical dermal and transdermal systems, whereby these are composed in the form of a multi-component system that is configured in a patch-like manner in such a way that they comprise a source of electrical energy, which is located in a communal supporting matrix, and a programmable microprocessor, which serves as a thermo-controller, and an activation circuit, whereby these are, for their part, technically connected to a device that produces electrically induced heat, and whereby the patch-like chip system can, in overall terms, be applied in a complementary manner to a topical dermal or transdermal system in such a way that the heat profile that is produced is transferred to the topical dermal or transdermal systems in such a way that these [systems] are thermodynamically activated in a controlled form.
2. Devices in accordance with claim 1, characterized by the feature that the communal supporting matrix is geometrically subdivided into operational function sectors that are mutually connected in an electrically conducting manner, whereby the connections between these function sectors can be configured in a reversible manner.
3. Devices in accordance with the preceding claims, characterized by the feature that the matrices and technically active components of the patch-like chip systems are composed of certain materials that possess mechanically elastic or plastic properties, and that are optically transparent or opaque, and that possess electrically conductive or magnetic properties, and that, chemically, are non-metallic polymers of natural or synthetic origin or they are metallic materials.
4. Devices in accordance with the preceding claims, characterized by the feature that additional electrical, electronic, magnetic, micro-mechanical, chemical, or chemo-technical components or combinations thereof are incorporated into these devices for specific usage purposes.
5. Devices in accordance with the preceding claims, characterized by the feature that control of the induced heat profile takes place either using an open-loop control technique or a closed-loop technique with feed-back via sensors.
6. Devices in accordance with the preceding claims, characterized by the feature that these [typo] contain devices for the reception and transmission of remote control signals, whereby such reception and transmission can take place either physically (via infrared, ultrasound, electromagnetic waves, or laser techniques) or in a chemosensory manner via chemically volatile substances.
7. Devices in accordance with the preceding claims, characterized by the feature that the

thermodynamic actor can also be triggered in sub-surfaces, including those with different temperatures.

8. Devices in accordance with the preceding claims, [characterized by the feature] that the thermodynamic actor can be configured in the form of all possible two-dimensional geometries.

9. Devices in accordance with the preceding claims, [characterized by the feature] that their production takes place technically, in parts or wholly, using roll-to-roll processes.

10. Devices in accordance with the preceding claims, characterized by the feature that these devices are used therapeutically in dermal and transdermal systems that do not contain pharmacologically active substances.

11. Devices in accordance with the preceding claims, characterized by the feature that these devices are used therapeutically for the purpose of regional hyperthermia for locally heating tumor cells, especially those in cases of tumors in the breast region, the skin region, or the genital region.

12. Devices in accordance with the preceding claims, characterized by the feature that these devices are used therapeutically in topical dermal or transdermal systems that contain the following as pharmacologically active substances: nitroglycerine, fentanyl, sufentanil, buprenorphine, morphine, hydromorphone [sic; hydromorphone?], lidocaine, indomethacin, ibuprofen, diclofenac, piroxicam, nicotine, clonidine, estradiol, progesterone, testosterone, norethisterone, oxybutynin, buspirone, scopolamine, including their chemical analogs, derivatives, isomers, and salts, either in the form of individual substances or in the form of combinations.

13. Devices in accordance with the preceding claims, characterized by the feature that these devices are used therapeutically in dermal or transdermal systems that comprise semi-solid or fluid forms as the pharmaceutical formulation, especially ointments, gels, creams, lotions, emulsions, suspensions, or solutions.

14. Devices in accordance with the preceding claims, characterized by the feature that these devices are used for the accelerated disintegration of epidermal or dermal deposits of active substances, especially deposits containing the following hormones: insulin, growth hormone, estradiol, progesterone, testosterone, including their chemical analogs.

15. Devices in accordance with the preceding claims, characterized by the feature that these devices are used in the form of patch-like dermal or transdermal diagnosis systems for collecting and analyzing the natural fluid from the skin, sweat, and the interstitial dermal fluid, and especially for analyzing the following substances that are contained therein: glucose, lactate, electrolytes, adrenalin, creatine, alcohol, along with medicinal preparations and drugs.

16. Devices in accordance with the preceding claims, characterized by the feature that these devices are used in the form of patch-like dermal or transdermal non-invasive diagnosis systems, whereby the collection and analysis of the fluid, which emerges onto the surface of the skin,

takes place by means of collection and sensor devices, which are integrated therein, and whereby the thermodynamic actor is arranged around them in a circular manner, and whereby the fluid from the skin is absorbed by a plate-like collection device, which is equipped with capillary channels, and the fluid is analyzed and evaluated by means of electronic chemosensors or chemical test strips, which are in contact with the fluid, and whereby this is used for the non-invasive analysis of, in particular, glucose, lactate, electrolytes, adrenalin, creatine, medicinal preparations, alcohol, and drugs.

17. Devices in accordance with the preceding claims, characterized by the feature that these devices are used in the form of patch-like dermal or transdermal micro-invasive diagnosis systems, whereby the collection and analysis of the interstitial fluid from the skin takes place by means of an integrated collection and sensor device, and whereby the thermodynamic actor is arranged around it in a circular manner, and whereby the interstitial fluid from the skin is absorbed or contacted by a plate-like collection device, which is equipped with micro-tubes, and whereby this collection device is suitable for penetrating the uppermost epidermal layer of skin, and the fluid is analyzed and evaluated by means of electronic chemosensors or chemical test strips, which are in contact with the fluid, and whereby this is used for the micro-invasive analysis of, in particular, glucose, lactate, electrolytes, adrenalin, creatine, medicinal preparations, and drugs.

18. Devices in accordance with the preceding claims, characterized by the feature that these devices are used in the form of patch-like dermal or transdermal non-invasive diagnosis systems, whereby the collection and conveying device for the fluid from the skin comprises, wholly or in parts, hollow polymeric fibers, micro-tubes, or hollow probes, which are made from a metallic, polymeric, or ceramic material, and whereby their angle of incidence can be adjusted to be vertical, inclined, or tangential relative to the perforations of the skin, and whereby this angle of incidence can also be reversibly readjusted by means of additional devices.

19. Devices in accordance with the preceding claims, characterized by the feature that these devices are used in the form of patch-like dermal or transdermal non-invasive or micro-invasive diagnosis systems, whereby the integrated sensor devices are configured in the form of planar electronic chemosensors.

20. Devices in accordance with the preceding claims, characterized by the feature that these devices are used in the form of patch-like dermal or transdermal non-invasive or micro-invasive diagnosis systems, whereby the sensor devices can be pushed into them, or removed from them, in a reversible manner.

21. Devices in accordance with the preceding claims, characterized by the feature that these devices are used in the form of patch-like dermal or transdermal non-invasive or micro-invasive diagnosis systems, whereby the analysis of the fluid takes place by means of chemical test strips that can be pushed into them, or removed from them, in a reversible manner.

22. Devices in accordance with the preceding claims, characterized by the feature that these devices are also used in the veterinary sector.